

Antibiotic Inhibition of Bacterial Cell Surface Assembly and Function

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Antibiotic Inhibition of Bacterial Cell Surface Assembly and Function provides a comprehensive, up-to-date description of the latest advances in research into microbial growth and how antimicrobial agents interfere with this process. Contents cover the gamut from basic studies of cell wall structure, function, assembly, and degradation to how "cell wall antibiotics" (especially β -lactams) inhibit or modify cellular processes. Special emphasis is given to the mechanisms of resistance and tolerance of microbes to antibiotics and possible strategies for overcoming these barriers. The impact of new methodologies, especially molecular biology, on this field is richly reflected.

An essential resource for any researcher or teacher needing the most current information on microbial growth and antimicrobial agents. Based on an ASM conference held in Philadelphia, Pa., May 1987.

Contents

- | | |
|--|--|
| I. Structure and Function (3 chapters) | VI. Outer Membrane Permeability (4 chapters) |
| II. Models of Cell Growth (7 chapters) | VII. β-Lactamases (5 chapters) |
| III. Wall Structure and Biosynthesis (5 chapters) | VIII. Non-β-Lactams (11 chapters) |
| IV. Autolysis and Peptidoglycan Hydrolases (8 chapters) | IX. Resistance (4 chapters) |
| V. Penicillin-Binding Proteins (19 chapters) | X. The Bacterial Surface—Where Does It Begin and End? |

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Phosphate Metabolism and Cellular Regulation in Microorganisms

Editors:

Annamaria Torriani-Gorini, *Massachusetts Institute of Technology, Cambridge, Mass.;*

Frank G. Rothman, *Brown University, Providence, R.I.;*

Simon Silver, *University of Illinois College of Medicine, Chicago, Ill.;*

Andrew Wright, *Tufts University Medical School, Boston, Mass.;*

and Ezra Yagil, *Tel Aviv University, Tel Aviv, Israel*

This important new volume presents the latest progress on DNA sequencing and analysis of phosphate transport systems, the Pho regulon and other regulons governing "global metabolism" in the cell, polyphosphates and their synthesis and degradation, and the export of proteins across the cell membrane. *Phosphate Metabolism and Cellular Regulation in Microorganisms* will be of interest to anyone investigating bacterial metabolism and molecular biology; it will also be of general interest to those with environmental concerns and interests in phosphate metabolism in higher organisms, both plants and animals. The work contains the proceedings of an international symposium held in Concarneau, France, June 1986.

CONDENSED CONTENTS

I. Phosphate Regulation in *Escherichia coli* (5 chapters)

Pho regulon, alkaline phosphatase gene regulation/phosphate response, phosphate regulon regulatory genes, PhoE protein expression, acid phosphatase regulatory characteristics

II. Phosphate Regulation in Diverse Organisms (4 chapters)

Bacillus licheniformis alkaline phosphatase: proteins and genes; *Saccharomyces cerevisiae* phosphatase synthesis regulation, phosphatase multigene family, and acid phosphatase synthesis

III. Protein Secretion and Use of Alkaline Phosphatase (7 chapters)

E. coli: phosphate-binding-protein synthesis/export machinery, phospholipids in protein secretion/energetics, foreign-protein secretion into periplasm, *lamB* protein export; alkaline phosphatase: protein secretion analysis, enzymatic activity and cellular location, membrane protein insertion into cytoplasmic membrane

IV. Structure and Function of Alkaline Phosphatase (4 chapters)

Site-directed mutagenesis, crystal structure, multinuclear NMR analytical approaches, *E. coli* isozyme formation/molecular mechanism

V. Transport of Phosphate and Phosphorylated Compounds in *Escherichia coli* (7 chapters)

Pst system: molecular, genetic, biochemical analyses; Pit system;

PhoE protein structure/function; glycerol 3-phosphate transport: *glpT*-, *ugp*-, and *uhp*-dependent systems

VI. Mechanisms and Energetics of Phosphate Transport in Other Organisms (4 chapters)

Pseudomonas aeruginosa outer membrane protein P phosphate-binding site, sugar phosphate transport/anion exchange, solute/ion transport, *S. cerevisiae* phosphate uptake

VII. Phosphate Reserves and Energy Storage: Polyphosphates (5 chapters)

E. coli accumulation/metabolism, *Acinetobacter lwoffii* surface pool, *Propionibacterium shermanii* polyphosphate kinase and glucokinase, biosynthesis and transport in yeasts

VIII. Phosphate Reserves and Energy Storage: Pyrophosphates (4 chapters)

NMR methanogen studies/cyclic pyrophosphates, inorganic pyrophosphate-supplied metabolic energy, *Rhodospirillum rubrum* energy conversion, regulation of pyrophosphate metabolism in plants

IX. Global Regulatory Systems in Enteric Bacteria (6 chapters)

Bacterial carbon metabolism, nitrogen assimilation, stable-RNA transcription initiation, phosphorylated metabolites/alarmones, *E. coli* DNA damage/stress responses

X. Historical Perspective: *E. coli* alkaline phosphatase gene-protein relationships

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STREPTOCOCCAL GENETICS

Edited by

JOSEPH J. FERRETTI

*University of Oklahoma Health Science Center
Oklahoma City, Okla.*

ROY CURTISS III

*Washington University
St. Louis, Mo.*

Streptococcal Genetics presents a compilation of the most recent work in this important area, featuring over sixty contributions from the leading workers in the field. There has been a dramatic increase in interest and activity on this subject over the past few years, as investigators from all disciplines have embraced the new approaches and tools that genetic studies afford.

Initially, streptococcal genetics research centered on the study of gene transfer, antibiotic resistance, and plasmid biology. However, in recent years there has been an emphasis on genetic aspects of streptococcal virulence, pathogenicity, and metabolism. These studies are directed towards the major health problems associated with strep-

tococcal diseases, namely, rheumatic heart disease, glomerulonephritis, dental caries, neonatal meningitis and septicemia, pneumonia, and skin and throat infections. Additionally, basic studies aimed at the elucidation of streptococcal fermentation pathways are of prime importance for food processing and dairy industries.

This volume is divided into five major sections, each with an introduction presenting an overview and historical perspective for each of the topics. Useful appendixes give information on streptococcal cloning vectors, nucleotide sequences, and amino acids. An attractive volume for both new and established investigators. Based on the Second ASM Conference on Streptococcal Genetics, May 1986.

CONDENSED CONTENTS

I. Gene Transfer (8 chapters)

Streptococcus sex pheromones, plasmid-related conjugation, transposons and mutagenesis, cloning systems, restriction systems, genetic transformation.

II. Antibiotic Resistance (10 chapters)

Resistance determinants, genes and products, conjugative transposons, natural genetic-information transfer, plasmid-borne resistance genes and products.

III. Pathogenic Streptococci (23 chapters)

M proteins: structural and genetic relationships, phase variation, genes, transcriptional studies of phase variants, surface expression; immunoglobulin G receptor gene; human and animal isolates; homologous sequences and host specificity; DNA fingerprints; exotoxins: genes and characterizations; streptokinase and amidase; plasmid hemolysin/bacteriocin determinants; hemolysin production; virulence; surface protein; immunoglobulin A1 protease gene; competence control region.

IV. Oral Streptococci (7 chapters)

Adhesion fimbriae structural gene, virulence components, glucosyltransferase gene and product, surface proteins and virulence, β -D-fructosidase.

V. Lactic Acid Streptococci (8 chapters)

β -Galactosidase gene and plasmids, transformation by electroporation, spheroplast transfection, Tn919, metabolic traits, plasmid-encoded structural genes, lactose metabolism, bacteriophages, bacteriophage insensitivity mechanisms.

Appendixes: Cloning vectors, nucleotide sequences, amino acids.

Indexes.

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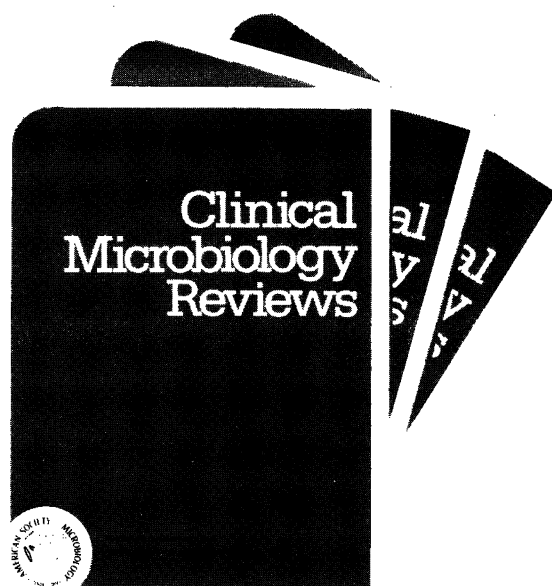
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— Forthcoming in 1988 —



CLINICAL MICROBIOLOGY REVIEWS

There has long been a need for a review journal devoted exclusively to clinical microbiology. In January 1988, CMR will fill that need. This new publication is directed toward clinical microbiologists, medical microbiologists and immunologists, public health workers, and infectious disease specialists who are interested in the pathogenesis, diagnosis, epidemiology, and control of human and veterinary pathogens. The journal will be very useful to the bench technologist as well as laboratory directors and infectious disease practitioners because the information will be relevant to what people in the laboratory are doing. The articles are intended to give them an extensive overview of what is current in the field.

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Editor: Josephine A. Morello

Quarterly: January, April, July, October. 400 pages. ISSN 0893-8512.

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Editors: Arnold L. Demain and
Nadine A. Solomon

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Proceedings of the 4th International Symposium

EDITORS: Ronald L. Crawford
and R. S. Hanson

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Bacteriophage T4

Editors: Christopher K. Mathews
Elizabeth M. Kutter
Gisela Mosig
Peter B. Berget

The outcome of the Evergreen T4 meetings, this book presents a complete overview of T4 research, from its earliest history to its latest developments. T4 is a remarkable organism, one that has played an important part in the growth of molecular biology research. Here its story is told for the first time in one place. From Doermann's *Introduction to the Early Years of Bacteriophage T4* to Guttman and Kutter's *Overview to Mathews' Postscript*, this book is informative, comprehensive, and up-to-date.

This book will be useful for upper-level students, virologists, and molecular biologists—in fact, indispensable for anyone with an interest in bacteriophage T4.

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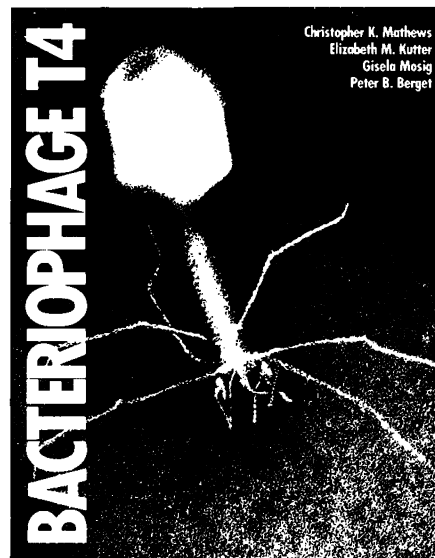
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|---|---|
| I. T4 Structure and Initiation of Infection | IV. Morphogenesis |
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| A. Enzymes and Proteins of DNA Metabolism | VI. Some Complexities of T4 Genes, Gene Products, and Gene Product Interactions |
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An appendix presents a table of T4 genes and gene products.

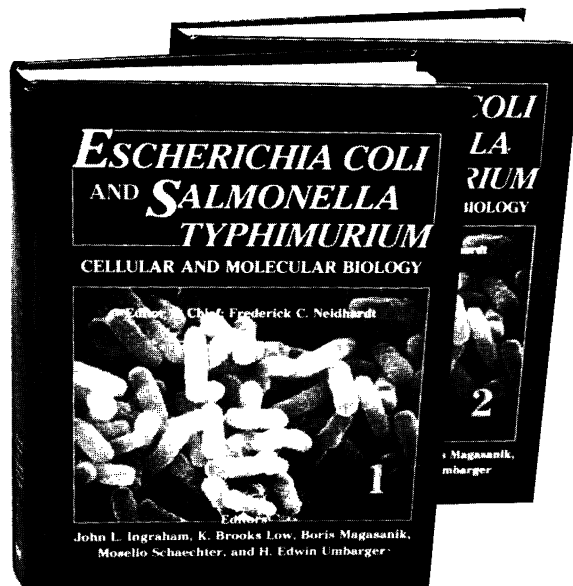
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Tufts University School of Medicine; and **H. Edwin Umbarger**, *Purdue University*

More is known about the molecular and cellular biology of *Escherichia coli* and its close relative *Salmonella typhimurium* than about any other organism. Over several decades, such a mountain of data has accumulated that few scientists can confidently command all relevant perspectives and vantage points. Research opportunities have been lost or retarded by the difficulty in assimilating information.

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Much of modern molecular biology has been worked out on *E. coli*. As the editors state, "Not everyone is mindful of it, but cell biologists have two cells of interest: the one they are studying and *Escherichia coli*." No investigator of basic biological questions at the cellular or subcellular level should ignore this landmark publication.

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- D. Gene Transfer: Transduction (2 chapters)
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VIRULENCE MECHANISMS OF BACTERIAL PATHOGENS

Editor

James A. Roth

Iowa State University, Ames, Iowa

Virulence Mechanisms of Bacterial Pathogens brings together the work of leading scientists examining bacterial virulence from different vantage points and disciplines: medicine, veterinary medicine, genetics, biochemistry, immunology, and microbiology. In addition, ongoing research involving higher biological contexts – the habitat of the bacterium, the circumstances under which infection occurs, and, especially, the interaction between pathogens and host defense mechanisms – is related to research at the molecular level.

By transcending disciplinary boundaries, this volume presents unique perspectives on the mechanisms of bacterial virulence. Scientists interested in the molecular aspects of bacterial virulence mechanisms in animal and human diseases will find this book extremely valuable. The overview chapters which introduce each of the five sections should also make the book useful to graduate students.

Based on an international symposium on *Virulence Mechanisms of Veterinary Bacterial Pathogens* held at Iowa State University, Ames, in June 1987.

Condensed Contents

Preface (Gyles)

I. Mechanisms of Bacterial Adherence, Colonization, and Invasion

(4 chapters by Arp, Isaacson, Freter, and Hale and Formal)

II. Bacterial Resistance to Humoral Defense Mechanisms

(4 chapters by Woolcock, Widders, Taylor, and Griffiths et al.)

III. Bacterial Resistance to Cellular Defense Mechanisms

(4 chapters by Czuprynski, Storz et al., Goren and Mor, and Collins and Hepper)

IV. Bacterial Toxins in Disease Production

(5 chapters by Rutter, Shewen, Robertson, Freer, and Scheuber et al.)

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VI. Past, Present, and Future Studies (Smith)

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